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Heteropterous insects in the Sandanski-Petrich Kettle, Southwestern Bulgaria

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1. Introduction

The Sandanski-Petrich Kettle lies along the valley of Struma River, from the exit of Kresna Gorge to the state boundary of Bulgaria with Greece. It also includes the valley of Strumeshnitsa River (a right tributary of Struma) from the state boundary of Bulgaria with Macedonia to its mouth into Struma, as well as the valleys of some smaller tributaries of Struma.

Our investigation of the heteropterous fauna of the valley also covers the places to the north, including Kresna Gorge and the slopes of the high mountains surrounding the valley up to 400 m a. s. l., i. e. a territory of 600 sq. km, which lies entirely in the belt of xerothermic oak forests (the lowest forest belt in Bulgaria).

Climatically the Sandanski-Petrich Kettle lies entirely in the Transitional-Mediterranean climatic zone of Bulgaria and is classified by some authors as a separate Sandanski-Petrich climatic region. It is the warmest and one of the driest regions of Bulgaria. The average annual temperature of Sandanski is 13.9°C, and of Petrich 14.6°C. The average rainfall in Sandanski amounts up to 534 mm, and in Petrich 670 mm.

Some plant species, which characterise the kettle as one having a Mediterranean climate, are mentioned by GÖLLNER-SCHEIDING & ARNOLD (1988). Here I would like to mention once again the woodlike juniper (*Juniperus excelsa*), a large plantation of which is found in the Kresna Gorge in the Tisata Reserve, and *Quercus coccifera*, which grows on the slopes along the right bank of the Struma River between the villages of Mikrevo and Gorna Krushitsa to the north of Sandanski Railway Station. These are two plant species, with which a great number of Mediterranean heteropterans are trophically connected, some of which (*Dichrooscytus bureschi, Orthotylus bureschi, O. junipericola balcanicus, Psallus varians cornutus*) are endemic for the Balkan Peninsula.

Of course, no representatives of the high mountainous heteropterous fauna,

characteristic for the mountains surrounding the kettle, could be expected. As it is evident from the references, this is obviously the best heteropterologically studied area in the Balkan Peninsula. This very fact - the completeness of the hitherto existing information, supplemented with some new data (the species designated with an asterisk) - has motivated the writing of the present article, the more so that correct conclusions on the zoogeographical character of the heteropterous fauna of a given region can be made only on the basis of a sufficiently complete faunistic information.

According to the here presented conception for the origin and zoogeographical character of the South European insect fauna (JOSIFOV, M., 1988, Ber. nat.-med. Verein Innsbruck 75: 177-184), the species found in the kettle can be classified in two groups on the basis of their belonging to the two basic faunistic complexes - the Mediterranean and the Euro-Siberian. A small group of species, which will be discussed further, are characterised by a large distribution in the tropics mainly in the Old World. But since they stick to the Mediterranean region in the boundaries of the Palaearctics , their separation into an independent tropical complex is hardly expedient. They might be viewed as belonging to the Mediterranean faunistic complex.

When there are no new faunistic data, the reference number of the publications, in which these species are reported from the investigated region are given after each species in the list of species below. The appurtenance of each species either to the Mediterranean or to the Euro-Siberian complex is indicated by respective abbreviations, followed by other abbreviations, giving a more precise idea of the general distribution of the species.

2. List of species

Abbreviations:

ESK - species from the Euro-Siberian complex
MK - species from the Mediterranean complex
Aeth - Ethiopian species
AM - Atlanto-Mediterranean species
AM1 - Atlanto-Mediterranean species with a wider distribution outside the Mediterranean
E - European species
End - Endemic
ES - Euro-Siberian species
HA - Holarctic species
HM - Holomediterranean species
HM1 - Holomediterranean species with a wider distribution outside the Mediterranean

WES - West Euro-Siberian species
HP - Holopalaearctic
MA - Middle-Asian species
MoM - Montane-Mediterranean
NM - North Mediterranean species
NM1 - North Mediterranean species with a wider distribution outside the Mediterranean
NTr - Neotropical species
PM - Ponto-Mediterranean species
PM1 - Ponto-Mediterranean species with a wider distribution
SES - South Euro-Siberian species
WES - West Euro-Siberian species
WM - West Mediterranean species
WP - West Palaearctic species
K - Cosmopolitan
KSZ - Cosmopolitan of the tropical and subtropical zones

The numbers in square brackets correspond to the number of the respective publication in References (Section 7).

Corixidae

Micronecta (*Micronecta*) *griseola* Horváth [12]; MK(PM).
**Corixa affinis* Leach - Rupite near Petrich, 10. VIII.1984; MK(HMl).
**Corixa* (*Corixa*) *punctata* Illiger - Rupite near Petrich, 10.VIII.1984; ESK(WP).
**Corixa* (*Hesperocorixa*) *linnaei* (Fieber) - Rupite near Petrich, VIII.1992; ESK(WP).
Sigara (*Sigara*) *striata* (Linnaeus) [25]; ESK(HP).
Sigara (*Subsigara*) *iactans* Jansson [25]; ESK(WP?).
Sigara (*Vermicorixa*) *lateralis* (Leach) [12, 24]; ESK(HP).
Sigara (*Pseudovermicorixa*) *nigrolineata nigrolineata* (Fieber) [12]; ESK(HP).

Ochteridae

Ochterus marginatus marginatus (Latreille) [1, 10, 12]; MK(KSZ).

Notonectidae

Notonecta glauca glauca Linnaeus [12]; ESK(ES).
Notonecta maculata Fabricius [12]; MK(HM, l).
Notonecta meridionalis Poisson (*glauca hybrida* Poisson) [1, 12]; MK(HM).
Notonecta viridis Delacurt [12]; MK(HM, l).
Anisops sardea Herrich-Schäffer [25]; MK(KSZ).

Pleidae

Plea minutissima minutissima Leach (*atomaria* auct.) [12]; ESK(WP).

Nepidae

Nepa cinerea Linnaeus (*rubra* Linnaeus) [1, 12]; ESK(HP).
Ranatra linearis Linnaeus [12]; ESK(HP).

Hebridae

Hebrus (*Hebrus*) *pusillus pusillus* (Fallén) [1]; ESK(WP).
Hebrus (*Hebrus*) *montanus* Kolenati [1, 10]; MK(HM).

Mesoveliidae

Mesovelia vittigera Horváth [24]; MK(KSZ).

Hydrometridae

Hydrometra stagnorum (Linnaeus) [1, 12]; ESK((HP).

Veliidae

Microvelia pygmaea (Dufour) [12]; ESK(HP).
Velia (*Plesiovelia*) *pelagonensis* Hoberlandt [2]; MK(PM).
Velia (*Plesiovelis*) *rhadamantha rhadamantha* Hoberlandt [12, 38]; MK(PM).
Velia (*Plesiovelia*) *mancinii mancinii* Tamanini [12, 37]; MK(PM).
Velia (*Plesiovelia*) *serbica* Tamanini [1]; MK(End).

Gerridae

Gerris (*Gerris*) *costai fieberi* Stichel [1, 12]; MK(PM).
Gerris (*Gerris*) *lacustris* (Linnaeus) [1, 12]; ESK(HP).
Gerris (*Gerris*) *maculatus* Tamanini (*italicus* Wagner) [8, 12]; MK(PMl).
Gerris (*Gerris*) *thoracicus* Schummel [12]; ESK(HP).
**Gerris* (*Gerris*) *argentatus* Schummel - Lebnitsa River estuary, 2.X.1983; ESK(HP).
**Aquarius paludum paludum* (Fabricius) - Rupite near Petrich, 17.VII.1988; ESK(ES).

Saldidae

Chartoscirta cincta cincta (Herrich-Schäffer) [12]; ESK(HP).
Chartoscirta cocksi (Curtis) [1, 12]; ESK(HP).
Chartoscirta elegantula elegantula (Fallén) [1, 12]; ESK(ES).
Saldula amplicolis (Reuter) [12]; MK(NM).
Saldula arenicola arenicola (Scholtz) [1, 12]; ESK(HA).
Saldula melanoscela (Fieber) [1, 12]; ESK(ES).
Saldula opacula (Zetterstedt) [1]; ESK(ES).
Saldula pallipes (Fabricius) [1]; ESK(HA).
Saldula saltatoria (Linnaeus) [1]; ESK(HA).
Macrosaldula variabilis connectens Horváth [1]; MK(NM, l).

Nabidae

Prostemma guttula (Fabricius) [1, 34]; MK(HM, l).
Prostemma sanguineum (Rossi) [1, 12]; MK(HM, l).
Alloeorhynchus flavipes (Fieber) [28]; MK(NM, l).
Aptus mirmicoides (Costa) (*Himacerus*) [1, 12]; ESK(WP).
Nabis (*Nabis*) *ferus* (Linnaeus) [1]; ESK(E).
Nabis (*Nabis*) *palifer* Seidenstücker [21]; MK(PM + MA)
Nabis (*Nabis*) *punctatus punctatus* Costa (*feroides* Remane) [1, 12]; ESK(WP).
Nabis (*Nabis*) *pseudoferus pseudoferus* Remane [1, 12]; ESK(WP).
Nabis (*Nabis*) *rugosus* (Linnaeus) [1]; ESK(WES).

Microphysidae

Loricula bipunctata (Perris) [1]; MK(AM).

Anthocoridae

Temnostethus (*Montandoniella*) *dacicus* (Puton) [1]; MK(PM).
Temnostethus (s. str.) *pusillus* (Herrich-Schäffer) [1]; ESK(E).
Temnostethus (s. str.) *tibialis* Reuter [1]; MK(HM).
Temnostethus (s. str.) *wichmanni* Wagner [1]; MK(PM).
Elatophilus (*Elatophilus*) *nigricornis* (Zetterstedt) [1, 16]; ESK(E).
Anthocoris confusus Reuter [1]; ESK(ES).
Anthocoris nemoralis (Fabricius) [1]; ESK(WP).
Orius (*Heterorius*) *horvathi* (Reuter) [1]; ESK(HP).
Orius (*Heterorius*) *laticollis* (Reuter) [1]; ESK(HP).
Orius (*Heterorius*) *majusculus* (Reuter) [1]; ESK(HP).
Orius (*Heterorius*) *minutus minutus* (Linnaeus) [1]; ESK(E).
Orius (*Orius*) *laevigatus* (Fieber) [1]; MK(AM).
Orius (*Orius*) *niger niger* Wolff [1, 12]; ESK(HP).
**Lyctocoris campestris* (Fabricius) - Rupite near Petrich, VIII.1982; MK(K).
**Lyctocoris dimidiatus* (Spinola) - Sandanski, 6.VI.1984; MK?(HMl).
Xylocoris galactinus (Fieber) [28]; ESK(HA).
Xylocoris obliquus (Costa) [28]; MK(HM).
Dysepicritus rufescens (Costa) [30]; MK(HM).
Cardiastethus nazarenus Reuter [1]; MK(HM).

Cimicidae

Cimex lectularius Linnaeus [12]; MK?(K).
**Oeciacus hirundinus* (Jenys) - Rupite near Petrich, 7.9.1976; ESK(HP).

Miridae

Monalocoris filicis atlanticus Lindberg [12, 25]; MK(HM?).

**Fulvius oxycarenoides* Reuter (*punctumalbum* Rossi) - near Petrich, III.1967; MK(NM).

Bothynotus pilosus (Boheman) [1]; ESK(ES).

**Deraeocoris* (*Deraeocoris*) *olivaceus* (Fabricius) - Rupite near Petrich, VII.1994; MK(HMl).

Deraeocoris (*Deraeocoris*) *ruber* (Linnaeus) [1, 12]; ESK(HA).

Deraeocoris (*Deraeocoris*) *rutilus* (Herrich-Schäffer) [1, 12]; MK(HM).

Deraeocoris (*Deraeocoris*) *trifasciatus* (Linnaeus) [1]; MK(HMl).

Deraeocoris (*Deraeocoris*) *ventralis* Reuter [1, 12]; MK(NMl).

Deraeocoris (*Knightocapsus*) *lutescens* (Schilling) [1]; MK(HMl).

Deraeocoris (*Knightocapsus*) *putoni* Montandon [24]; MK(PM).

Deraeocoris (*Camptobrochis*) *serenus* (Douglas & Scott) [1, 12]; MK(HMl).

?*Deraeocoris* (*Camptobrochis*) *punctulatus* (Fallén) [1].

Macrolophus costalis Fieber [1, 12]; MK(HMl).

Macrolophus pygmaeus (Rambur) (*balcanicus* Wagner) [10, 12, 24]; ESK(WP).

Dicyphus (*Dicyphus*) *errans* (Wolff) [1, 10, 12]; ESK(WP).

Dicyphus (*Dicyphus*) *cerastii* Wagner [1, 12]; MK(NM).

Dicyphus (*Dicyphus*) *hyalinipennis* (Burmeister) [10]; MK(HMl).

Dicyphus (*Brachyceraea*) *globulifer* (Fallén) [1]; ESK(WP).

Dicyphus (*Brachyceraea*) *geniculatus* Fieber [1]; MK(NM).

Dicyphus (*Mesodicyphus*) *martinoi* Josifov [1, 24]; MK(End).

Campyloneura virgula (Herrich-Schäffer) [12]; ESK(WP).

Stethoconus cyrtopeltis (Flor) [28]; ESK(E).

Acetropis (*Acetropis*) *carinata* (Herrich-Schäffer) [1, 10, 12]; MK(HMl).

Acetropis (*Acetropis*) *gimmerthali* (Flor) [1]; MK(HMl).

Acetropis (*Acetropis*) *sinuata* Wagner (*josifovi* Wagner) [1, 9, 12]; MK(HM?).

Stenodema (*Brachystira*) *calcaratum* (Fallén) [1, 12]; ESK(HP).

Stenodema (*Stenodema*) *laevigatum* (Linnaeus) [1, 12]; ESK(HP).

Stenodema (*Stenodema*) *virens* (Linnaeus) [1, 12]; ESK(ES).

Notostira elongata (Geoffroy) [1]; ESK(WP).

Megaloceraea recticornis (Geoffroy) [1, 12]; ESK(WP).

Trigonotylus coelestialium Kirkaldy (*rufícornis* auct.) [1, 12, 23]; ES ESK(ES).

Trigonotylus pulchellus (Hahn) [23]; ESK(WP).

Trigonotylus tenuis Reuter (*pallidicornis* Reuter) [1, 24]; MK(KSZ).

**Myrmecoris gracilis* (R. Sahlberg) - Kresna, near the estuary of Vlahinska River, 8.VII.1994; ESK(ES).

Pantilius tunicatus (Fabricius) [30]; ESK(WES).

Phytocoris (*Eckerleinius*) *incanus* Fieber [1, 21]; MK(PM + MA).

Phytocoris (*Ktenocoris*) *insignis* Reuter [10, 12]; ESK(E).

Phytocoris (*Ktenocoris*) *tridens* Wagner [12]; MK(PM).

Phytocoris (*Ktenocoris*) *ulmi* (Linnaeus) [12]; ESK(WP).

Phytocoris (*Ktenocoris*) *varipes* (Boheman) [1]; ESK(WP).

Phytocoris (*Leptophytocoris*) *ustulatus* Herrich-Schäffer [12]MK(NMl).
Phytocoris (*Compsocerocoris*) *femoratus* Kerzhner & Schuch (*femoralis* Fieber); MK(WM).
Phytocoris (*Compsocerocoris*) *perangustus* Wagner [21]; MK(PM).
Phytocoris (*Compsocerocoris*) *strimonensis* Josifov [27]; MK(End).
**Phytocoris* (*Phytocoris*) *dimidiatus* Kirschbaum - Kresna Gorge: N of Kresna, 2.VI.1984; ESK(WP).
**Phytocoris* (*Phytocoris*) *populi* (Linnaeus) - Kresna Gorge: Kresnensko Hanche, 16.VIII.1984; ESK(WP).
Phytocoris (*Phytocoris*) *reuteri* Saunders [12]; ESK(E).
Phytocoris (*Phytocoris*) *tiliae* (Fabricius) [12]; ESK(WP).
Phytocoris (*Stictophytocoris*) *meridionalis* Herrich-Schäffer [12]; ESK(WP).
Phytocoris (*Ribautomiris*) *minor* Kirschbaum [25]; MK(NM).
Phytocoris (*Ribautomiris*) *parvulus* Reuter [21, 24]; MK(PM).
Megacoelum beckeri (Fieber) [1]; MK(AM).
Megacoelum infusum (Herrich-Schäffer) [12]; ESK(E).
Adelphocoris insignis Horváth [1, 16]; MK(PM).
Adelphocoris lineolatus lineolatus (Goeze) [1, 12]; ESK(HP).
Adelphocoris seticornis (Fabricius) [1, 9, 12]; ESK(ES).
Adelphocoris ticinensis (Meyer-Dür) [12]; ESK(SES).
Adelphocoris vandalicus (Rossi) [1, 12]; MK(NM + MA).
Calocoris angularis (Fieber) [1, 12]; MK(PM).
Closterotomus annulus (Brullé) [1, 10, 12]; MK(PM).
Closterotomus cinctipes (Costa) [1, 12]; MK(PM).
Closterotomus fulvomaculatus (De Geer) [1]; ESK(HA).
Closterotomus norwegicus (Gmelin) [1]; ESK(HA).
Closterotomus princeps (Reuter) [1]; MK(PM).
Rhabdomiris striatellus (Fabricius) [1]; MK(HMl).
Miris striatus (Linnaeus) [1]; ESK(WP).
Brachycoleus decolor (Reuter) [1]; ESK(ES).
Stenotus binotatus (Fabricius) [12]; ESK(ES + NA).
Dichrooscytus bureschi Josifov [1, 20]; MK(End).
Dichrooscytus rufipennis (Fallén) [1]; MK(NMl).
Lygocoris (*Apolygus*) *lucorum* (Meyer-Dür) [12]; ESK(ES).
Lygocoris (*Apolygus*) *spinolai* (Meyer-Dür) [1]; ESK(ES).
Lygocoris (*Neolygus*) *zebei* Günther [1a]; ESK(E).
Taylorilygus pallidulus Blanchard (*Lygus apicalis*) [12]; MK(KSZ).
Lygus gemellatus (Herrich-Schäffer) [1, 12]; ESK(HP).
Lygus pratensis (Linnaeus) [1, 12]; ESK(HP).
Lygus rugulipennis Poppius [1, 12]; ESK(HP).
Orthops (*Montanorthops*) *foreli* (Fieber) [1, 10, 12]; MK(PM, MoM).
**Orthops* (s. str.) *campestris* (Linnaeus); Rupite near Petrich, VII.1984; ESK(HA).

Orthops (s. str.) *kalmi* (Linnaeus) [1, 12]; ESK(HP).
Agnocoris reclairei Wagner [12]; ESK(WP).
Agnocoris rubicundus (Fallén) [1, 12]; ESK(HA).
Liocoris tripustulatus (Fabricius) [1, 12]; ESK(ES).
Camptozygum aequalis (Vuillefroy) [30]; MK(WP).
Cyphodema instabile (Lucas) [1, 5, 12]; MK(HM).
Polymerus (*Poeciloscytus*) *vulneratus* (Panzer) [1]; ESK(HP).
Polymerus (*Poeciloscytus*) *cognatus* (Fieber) [1]; ESK(ES).
Polymerus (*Poeciloscytus*) *palustris* Reuter [1]; ESK(ES).
Polymerus (*Poeciloscytus*) *unifasciatus* (Fabricius) [12]; ESK(HA).
Polymerus (*Polymerus*) *nigritus* (Fallén) [1]; ESK(ES).
Charagochilus gyllenhali (Fallén) [1, 12]; ESK(WP).
**Charagochilus weberi* Wagner - Kresna Gorge: near Kresnensko Hanche, 14.VIII.1986; MK(NMl).
Capsus ater (Linnaeus) [1]; ESK(HA).
Horistus (*Primihoristus*) *orientalis* (Gmelin) (*Capsodes cingulatus* F.) [1, 12]; MK(HMl).
Dionconotus neglectus neglectus (Fabricius) [1]; MK(PM).
Halticus apterus apterus (Linnaeus) [1, 12]; ESK(HA).
Halticus luteicollis (Panzer) [12]; MK(HMl).
Halticus macrocephalus Fieber [1, 12]; MK(HMl).
Halticus major Wagner [12]; ESK(E).
Strongylocoris cicadifrons Fieber [1]; MK(HM).
Strongylocoris leucocephalus (Linnaeus) [1]; ESK(HP).
Strongylocoris luridus Fallén [9, 12]; ESK(WP).
Piezocranum simulans Horváth [1, 9, 12]; MK(NMl).
Orthocephalus bivittatus Fieber [1, 16]; MK(NMl).
Orthocephalus parvulus Reuter [1, 10, 12]; MK(PM).
Orthocephalus saltator (Hahn) [1, 12]; ESK(HA).
Reuteria marqueti Puton [1]; MK(NMl).
Malacocoris chlorizans (Panzer) [12]; ESK(WP).
Heterocordylus (*Heterocordylus*) *cytisi* Josifov [1, 6, 12]; MK(PM).
Heterocordylus (*Heterocordylus*) *farinosus* Horváth [1]; MK(PM).
Heterocordylus (*Heterocordylus*) *leptocerus* (Kirschbaum) [1, 6, 12]; ESK(E).
Heterocordylus (*Heterocordylus*) *tumidicornis* (H.-S.) [1]; MK(NMl).
Orthotylus (*Melanotrichus*) *flavosparsus* (Sahlberg) [1, 10, 12]; ESK(HA).
Orthotylus (*Neopachylops*) *bureschi* Josifov [1, 15]; MK(PM).
Orthotylus (*Neopachylops*) *junipericola balcanicus* Josifov [18]; MK(PM).
Orthotylus (*Neopachylops*) *virescens* (Douglas & Scott) [12]; ESK(ES).
Orthotylus (*Orthotylus*) *marginalis* Reuter [1, 10, 12]; ESK(HP).
Orthotylus (*Orthotylus*) *prasinus* (Fallén) [1]; ESK(E).

**Orthotylus* (*Orthotylus*) *quercicola* Reuter - Kresna Gorge, VI.1992; Rozhen above Melnik, VI.1992; MK(PM).

**Orthotylus* (*Orthotylus*) *tenellus* (Fallén) subsp. n. - Rozhen above Melnik, 10.VII.1992; MK(End?).

Orthotylus (*Pinocapsus*) *fuscescens* (Kirschbaum) [1, 17, 29]; MK(E).

Blepharidopterus angulatus (Fallén) [1, 12]; ESK(HP).

Blepharidopterus diaphanus (Kirschbaum) (*Orthotylus*) [1]; ESK(ES).

Globiceps (*Globiceps*) *sphegiformis* (Rossi) [12]; MK(HMl).

Globiceps (*Paraglobiceps*) *fulvicollis* Jakovlev (*cruciatus* Reuter) [12]; ESK(E).

Globiceps (*Paraglobiceps*) *horvathi* Reuter [1]; MK(NM).

Cyllecoris histrionius (Linnaeus) [1]; MK(NMl).

**Dryophilocoris* (s. str.) *flavoquadrimaculatus* (De Geer) - Rupite near Petrich, 18.IV.1980; MK(HMl).

Pilophorus perplexux Douglas & Scott [1, 12]; ESK(WP).

Pilophorus cinnamopterus (Kirschbaum) [1]; ESK(ES + NA).

Pilophorus confusus (Kirschbaum) [1]; ESK(HP).

Pilophorus dianae Josifov [26]; MK(End).

Acrorrhinium conspersus Noualhier [25]; MK(PM).

Cremnocephalus alpestris Wagner [30]; ESK(WES).

Systellonotus triguttatus (Linnaeus) [1]; ESK(WP).

Systellonotus discoidalis Horváth (*scopliensis* Kormilev) [8, 12]; MK(PM).

Omphalonotus quadriguttatus (Kirschbaum) [28]; ESK(ES).

Hallodapus montandoni (Reuter) [1, 10, 28]; ESK(WP).

Plagiorrhamma suturalis (Herrich-Schäffer) [1, 12]; MK(NM).

Mimocoris rugicollis (Costa) [1, 8, 12]; MK(PM).

Hallodapus montandoni Reuter [1, 10]; MK(PM).

Cremnorrhinus basalis Reuter (*basalis minor* Wagner) [1, 12]; MK(End).

Macrotylus (*Alloeonycha*) *dentifer* Wagner (*elevatus* auct.) [1, 12]; MK(PM).

Macrotylus (*Alloeonycha*) *paykulli interpositus* Wagner, **stat. n.** [1, 12]; MK(NM).

Macrotylus (*Alloeonycha*) *solitarius* (Meyer-Dür) [1]; ESK(WES).

Oncotylus Cylindromelus) *setulosus* (Herrich-Schäffer) [12]; MK(HM + MA).

Harpocera thoracica (Fallén) [1]; MK(AMl).

**Harpocera hellenica* Reuter - Stara Kresna, 24.IV.1983; MK(End).

Plagiognathus (*Plagiognathus*) *bipunctatus* Reuter [1, 12]; MK(PM).

Plagiognathus (*Plagiognathus*) *chrysanthemi* (Wolff) [1]; ESK(ES).

Plagiognathus (*Plagiognathus*) *fulvipennis* (Kirschbaum) [1, 12]; MK(NMl).

Plagiognathus (*Plagiognathus*) *alpinus* (Reuter) (*Psallus*) [1, 12]; ESK(ES).

Europiella flavipes (Reuter) (*Plagiognathus mamorai* Lindberg) [12]; MK(NM).

Europiella artemisiae (Becker) (*gracilis* Wagner) [1]; MK(NMl).

Europiella albipennis (Fallén) (*lanuginosa* Jakovlev) [1]; ESK(HP).

Atomoscelis onustus (Fieber) [28]; MK(HMl).

Campylomma annulicornis (Signoret) [12]; MK(HM + MA + Md).
Campylomma diversicornis Reuter [28]; MK(PM).
Campylomma novaki Wagner [28]; MK(End).
Campylomma simillima Jakovlev [28]; MK(PM + MA).
Campylomma verbasci (Meyer-Dür) [1, 12]; ESK(HP).
Monosynamma bohemani (Fallén) [11, 12]; ESK(HA).
Phoenicocoris obscurelluw (Fallén) [30]; MK(WES).
Phoenicocoris modestus (Meyer-Dür) [30]; ESK(WES).
Chlamydatus (*Attus*) *pullus* (Reuter) [1]; ESK(ES).
Salicarus roseri (Herrich-Schäffer) (*Sthenarus*) [12]; ESK(WP).
Sthenarus (*Sthenarus*) *rottermundi* (Scholtz) [1]; ESK(E).
Criocoris crassicornis (Hahn) [12]; ESK(WP).
Atractotomus magnicornis (Fallén) [30]; MK(WES).
Atractotomus mali (Meyer-Dür) [1]; ESK(WP).
Atractotomus marcoi Carapezza [30]; MK(HM?).
Heterocapillus (*Heterocapillus*) *tigripes* (Mulsant) [1]; MK(HMl).
Lepidargyrus ancorifer Fieber (*Psallus*) [1, 10, 12]; MK(HMl).
Psallus (*Hylopsallus*) *perrisi* (Mulsant) [1]; ESK(WP).
**Psallus (Phylidea) nigripilis* (Reuter) - Kresna Gorge, 14.V.1972; MK(PM).
Psallus (*Phylidea*) *quercus* (Kirschbaum) [1]; HM(HMl).
Psallus (*Psallus*) *asthenicus* Seidenstücker [1, 21]; MK(PM).
**Psallus* (*Psallus*) *cruentatus* Mulsant & Rey - Rupite near Petrich, 17.V.1982; MK(NM).
Psallus (*Psallus*) *milenae* Josifov [19]; MK(PM).
**Psallus* (*Psallus*) *mollis* Mulsant - Rupite near Petrich, 17.V.1982; MK(HMl).
Psallus (*Psallus*) *varians cornutus* Wagner [12 as *varians* H.-S.]; MK(PM).
Nanopsallus carduellus (Horváth) (*Psallus*) [8, 12]; MK(PM).
Compsidolon (*Apsinthophylus*) *pumilum* Jakovlev (*atomosum* Reuter) [12]; MK(PM).
Acrotelus caspicus Reuter [1, 21]; MK(PM).
**Lopus decolor palliatus* (Perris) - above Sandanski, VIII.1960; MK(NM)..
Eurycolpus bipunctatus Wagner [1]; MK(End).
Eurycolpus flaveolus (Stål) [12]; ESK(HP).
Orthonotus cylindricollis (Costa) [1, 12]; MK(HM).
Orthonotus rufifrons (Fallén) [1]; ESK(WP).
Plesiodema pinetellum (Zetterstedt) [30]; MK(WP).
**Phylus* (*Phylus*) *melanocephalus* (Linnaeus) - Kresna Gorge and Rupite near Petrich, VI. - VII.; ESK(WP).
Adelphophylus balcanicus (Kormilev) (*Phylus*) [1, 10, 12]; MK(End).
Amblytylus brevicollis Fieber [1, 10, 12]; MK(HM).
Amblytylus concolor Jakovlev [1, 12]; MK(HM).
Amblytylus glaucicollis Kerzhner (*testaceus* auct.) [21]; MK(PM).

Amblytylus luridus Hoberlandt [25]; MK(PM).
**Amblytylus longiceps* (Flor) - Rupite near Petrich, 25.VII.1994; ESK(E).
Amblytylus macedonicus Wagner [1, 12]; MK(PMl).
Amblytylus nasutus (Kirschbaum) [1]; ESK(WP).
Hoplomachus thunbergi (Fallén) [1]; ESK(ES).
Pachyxyphus lineellus (Mulsant & Rey) [24]; MK(HM).
Opisthotaenia fulvipes Reuter [1, 16]; MK(PM).
Megalocoleus dissimilis (Reuter) [12]; MK(HM).
Megalocoleus hungaricus Wagner [1, 10, 12]; MK(PM).
Megalocoleus molliculus (Fallén) [12]; ESK(HP).
Thermocoris algiricus Wagner [1, 28]; MK(HM).
Tinicephalus discrepans Fieber [10, 12]; MK(WM).
Placochilus seladonicus mediterraneus Josifov [15]; MK(HM?).
Asciodema obsoletum (Fieber) [12]; ESK(WP).
Paredrocoris seidenstueckeri Josifov (*pectoralis* auct.) [9, 12, 14]; MK(End).
Auchenocrepis reuteri Jakovlev [8, 12]; MK(PM).
Tuponia (*Chlorotuponia*) *linnavuorii* Wagner [12]; MK(End).
Tuponia (*Chlorotuponia*) *michalki* Wagner [1, 12]; MK(HM).
Tuponia (*Chlorotuponia*) *prasina* (Fieber) (*apicalis* Reuter) [1, 12]; MK(PM + MA).
Tuponia (*Tuponia*) *arcufera* Reuter (*eckerleini* Wagner) [1, 10, 12]; MK(NM).
Tuponia (*Tuponia*) *macedonica* Wagner [11, 12]; MK(PM).
Isometopus longirostris Josifov [29]; MK(End).

Tingidae

Acalypta hellenica Reuter [24]; MK(NM).
Acalypta marginata (Wolff) [12]; ESK(ES).
Dictyonota strichnocera Fieber [12]; ESK(E).
Kalama tricornis (Schrank) [1]; ESK(HP).
Derephysia (*Derephysia*) *foliacea* (Fallén) [1]; ESK(ES).
Galeatus decorus Jakovlev [8, 12]; MK(PM).
Stephanitis pyri (Fabricius) [1]; ESK(HP).
Lasiacantha capucina piligera Gabriglietti [1]; MK(PM?).
Tingis (*Neolasiotropis*) *pilosa pilosa* Hummel [1]; ESK(HP).
Tingis (*Tingis*) *ampliata* (Herrich-Schäffer) [1]; ESK(ES)..
Tingis (*Tingis*) *angustata* (Herrich-Schäffer) [12]; MK(HMl).
Tingis (*Tingis*) *auriculata* (Costa) [1, 12]; (MK(HMl).
Tingis (*Tingis*) *cardui* (Linnaeus) [1, 12]; ESK(HP).
Tingis (*Tingis*) *crispata* (Herrich-Schäffer) [1, 12]; MK(PKl + MA).
Tingis (*Tingis*) *grisea* Germar (*rotundicollis* Jakovlev) [1]; MK(PMl).
Tingis (*Tropidocheila*) *geniculata* (Fieber) [1]; MK(HMl).
Tingis (*Tropidocheila*) *hellenica hellenica* (Puton) [12]; MK(PM).

Catoplatus carthusianus (Goeze) [1, 12]; MK(HMl).
Catoplatus horvathi (Puton) [1]; ESK(WP).
Catoplatus minor Štusak (*hilaris* auct.) [1, 13, 35]; MK(PM).
Copium brevicorne (Jakovlev) [1, 12]; MK(PM).
Copium clavicorne (Linnaeus) [1, 12]; MK(NMl).
Copium teucrii (Host) (*horvathi* Wagner) [1, 12]; MK(HM).
Physatocheila dumetorum (Herrich-Schäffer) [1]; MK(HM).
Oncochila scapularis (Fieber) [12]; ESK(SES).
Oncochila simplex (Herrich-Schäffer) [1]; ESK(ES).
Dictyla convergens (Herrich-Schäffer) [36]; ESK(WP).
Dictyla echii (Schrank) [1, 12]; ESK(HP).
Dictyla humuli (Fabricius) [1]; ESK(ES).
Dictyla lupuli (Herrich-Schäffer) [12]; ESK(ES).
Dictyla nassata (Puton) [1]; MK(HM + MA).
Dictyla rotundata (Herrich-Schäffer) (*Octacysta*) [1, 12]; MK(PMl).
Monosteira unicostata (Mulsant & Rey) [1, 5, 12]; MK(HM).
Agramma atricapillum (Spinola) [1, 12]; MK(HM).
Agrama blandum (Horváth) [13]; MK(PM).
Agramma laetum (Fallén) (*confusum* Puton) [1, 5, 12]; ESK(ES).

Reduviidae

**Metapterus linearis* Costa - Rupite near Petrich, 12.V.1982; MK(HM).
**Empicoris culiciformis* (De Geer) - Rupite near Petrich, 25.III.1982; ESK(HA).
Sastrapada baerensprungi (Stål) [30]; MK(KSZ).
**Oncocephalus squalidus* (Rossi) - Rupite near Petrich, 21.X.1988; MK(HM).
Reduvius pallipes (Klug) [12]; MK(PM).
Reduvius personatus (Linnaeus) [12]; ESK(HA).
Pirates hybridus (Scopoli) [1]; MK(HMl).
Coranus griseus (Rossi) (*aegyptius* auct.) [1, 12, 34]; MK(HM).
Coranus subapterus (De Geer) [1, 12]; ESK(HP).
Coranus tuberculifer Reuter [34]; MK(HM + MA).
Rhinocoris iracundus (Poda) [1, 12]; MK(HMl + MA).
Rhinocoris punctiventris (Herrich-Schäffer) [12]; MK(PM).
Sphedanolestes pulchellus (Klug) [12]; MK(PM).

Phymatidae (Macrocephalidae)

Phymata crassipes (Fabricius) [1, 12]; MK(HMl).

Aradidae

Aradus betulae Linnaeus) [12]; ESK(SES).
Aradus depressus (Fabricius) [1]; ESK(ES).
Aradus flavicornis Reuter [28]; MK(HM).

Aradus krueperi Reuter [28] MK(HMl).
Aradus obtectus Vásárhelyi [39]; ESK(ES).
Aradus ribauti Wagner [24]; MK(NM).

Aneuridae

Aneurus laevis (Fabricius) [1]; ESK(WES).

Berytidae

Neides aduncus Fieber [12]; MK(HM).
Neides tipularius (Linnaeus) [1]; ESK(WP).
**Apoplymus pectoralis* Fieber - Kresna Gorge: 15 km S of Simitli, 7.VI.1967; Rupite near Petrich, 17.V.1983; MK(HM).
Berytinus (*Berytinus*) *clavipes* (Fabricius) [12]; ESK(HP).
**Berytinus* (*Berytinus*) *hirticornis hirticornis* (Brullé) - P. Yavorov Railway Station, 1.X.1992; MK(NMl).
Berytinus (*Lizinus*) *distinguendus* (Ferrari) [9, 12]; MK(NM).
Berytinus (*Lizinus*) *geniculatus* (Horváth) [1]; MK(NMl).
Berytinus (*Lizinus*) *montivagus montivagus* (Meyer-Dür) [1, 12]; ESK(WP).
Berytinus (*Lizinus*) *signoreti* (Fieber) [1]; ESK(WP).
Berytinus (*Lizinus*) *striola* (Ferrari) [8, 12]; MK(HM).
Metacanthus (*Cardopostethus*) *annulosus* (Fieber) (*brevipes* Horv.) [13]; MK(PM).
Metacanthus (*Metacanthus*) *meridionalis* (Costa) [1]; MK(NM).
Gampsocoris culicinus Seidenstücker [1, 5, 12]; MK(PMl).
Gampsocoris enslini Seidenstücker [12]; MK(PM).
Gampsocoris lilianae Josifov [7, 12, 36]; MK(End).

Lygaeidae

**Tropidothorax leucopterus* (Goeze) - Rupite near Petrich, 18.IX.1995; MK(NM).
Lygaeus equestris equestris (Linnaeus) [1, 12]; ESK(HP).
Lygaeus pandurus (Scopoli) [12]; MK(KSZ).
Lygaeus saxatilis (Scopoli) [1, 12]; MK(HMl).
Melanocoryphus albomaculatus (Goeze) [1]; MK(HMl).
Melanocoryphus tristrami (Douglas & Scott) [1, 12]; MK(PM).
Horvathiolus superbus (Pollich) (*Melanocoryphus*) [1, 12]; MK(NMl).
Lygaeosoma anatolicum Seidenstücker (*sibiricus* auct.) [12]; MK(PM).
Lygaeosoma angulare Reuter [30]; MK(PM).
Lygaeosoma sardea Spinola (*reticulatum* Herrich-Schäffer) [1, 12, 34]; MK(HMl + MA).
**Arocatus roeseli* (Schilling) - Kresna Gorge, 5.VII.1994; MK(NMl).
Arocatus longiceps Stål [1, 12]; MK(PM).
Apterola lowni (Saunders) [1, 13]; MK(PM).

**Caenocoris nerii* (Germar) - Rupite near Petrich, 18.VIII.1995, new species for the Bulgarian fauna; MK(HM).
Nysius (*Macroparius*) *cymoides* (Spinola) [1]; MK(HMl + MA).
Nysius (*Macroparius*) *helveticus* (Herrich-Schäffer) [1]; ESK(ES).
?*Nysius* (*Nysius*) *ericae ericae* (Schilling) [1, 12]
Nysius (*Nysius*) *thymi* (Wolff) [1]; ESK(ES + MA).
Nysius (*Tropinysius*) *senecionis senecionis* (Schilling) [1, 12]; MK(HM + MA).
Nysius (*Macroparius*) *graminicola* (Kolenati) [12]; MK(HM + MA).
Nysius (*Macroparius*) *helveticus* (Herrich-Schäffer) [12]; ESK(ES).
Ortholomus punctipennis (Herrich-Schäffer) [1, 12]; ESK(WP).
Orsillus depressus Dallas [24]; MK(HM).
**Orsillus maculatus* (Fieber) - Kulata, 21.V.1989, on *Cupressus;* MK(NM).
Kleidocerys privignus (Horváth) [1]; MK(PM).
**Kleidocerys resede* (Panzer) - Kresnensko Hanche, VII.1994; ESK(ES + NA).
Kleidocerys truncatulus (Walker) [30]; MK(NM).
Cymus claviculus (Fallén) [1, 12]; ESK(HA).
Cymus glandicolor Hahn [1, 12]; ESK(HP).
Cymus melanocephalus Fieber [1, 12]; MK(HMl).
Ischnodemus caspius Jakovlev [24]; MK(PM + MA).
Dimorphopterus doriai Ferrari (*Blissus*) [1, 12]; MK(NM).
Dimorphopterus spinolai (Signoret) [1]; ESK(ES).
Geocoris (*Piocoris*) *erythrocephalus* (Lepeletier & Serville) [1, 12]; MK(HM).
Geocoris (*Geocoris*) *ater* (Fabricius) (*albipennis* F.) [12]; ESK(HA).
Geocoris (*Geocoris*) *lineola* (Rambur) [25, 30]; MK(HM).
Geocoris (*Geocoris*) *megacephalus* Rossi (*arenarius* Jakovlev) [1, 5, 12]; MK(HM + MA).
Geocoris (*Geocoris*) *pallidipennis* (Costa) [1, 12]; MK(KSZ).
Geocoris (*Geocoris*) *pubescens* (Jakovlev) [12]; MK(PM).
Heterogaster affinis Herrich-Schäffer [1, 12]; MK(HMl).
Heterogaster artemisiae Schilling [1, 12]; MK(HMl).
Heterogaster cathariae (Geoffroy) [12]; MK(HMl).
Heterogaster urticae (Fabricius) [1]; ESK(WP).
**Platyplax salviae* (Schilling) - Kresna Gorge: 10 km S of Simitli, 10.VII.1971; MK(HMl + MA).
Artheneis wagneri Ribes (*alutacea* auct.) [1, 8, 30a]; MK(NM).
Artheneis balcanica (Kormilev) [1, 8, 12]; MK(PM).
Holcocranum saturejae (Kolenati) [1, 12]; MK(NM).
Tropidophlebia costalis (Herrich-Schäffer) [30]; ESK(WP).
Camptotelus lineolatus (Schilling) [1]; MK(HM).
Microplax albofasciata (Costa) [1]; MK(HM).
Microplax interrupta (Fieber) [1]; MK(HM + MA).
Metopoplax ditomoides (Costa) [1]; MK(HMl).
Metopoplax origani (Kolenati) [1]; MK(HMl).

Macroplax fasciata fasciata (Herrich-Schäffer) [1]; MK(HMl + MA).
Brachyplax tenuis (Mulsant & Rey) [1]; MK(HM).
Oxycarenus hyalinipennis (Costa) [28]; MK(HM).
Oxycarenus modestus (Fallén) [1]; ESK(WP).
Oxycarenus pallens (Herrich-Schäffer) [1]; MK(HM).
Auchenodes costalis (Lethierry) (*joakimoffi* Sdst. & Jos.) [31]; MK(NM?).
Plinthisus (*Plinthisus*) *brevicollis* Ferrari (*hungaricus* Horváth) [1]; MK(NM).
Plinthisus (*Plinthisus*) *brevipennis* (Latreille) [1]; ESK(WP).
Plinthisus (*Isioscytus*) *ptilioides* Puton [28]; MK(PM).
Hyalochilus dolosus Horváth [16]; MK(PM).
Acompus pallipes (Herrich-Schäffer) [1]; MK(NMl).
Acompus rufipes (Wolff) [1]; ESK(HP).
Stygnocoris faustus Horváth [25]; MK(NM + MA).
Stygnocoris sabulosus (Schlling) [1]; ESK(ES).
Stygnocoris similis Wagner [25]; MK(PM).
Tropistethus fasciatus Ferrari [1]; MK(NM).
Tropistethus holosericeus (Scholtz) [1]; ESK(WP).
Ischnocoris bureschi Josifov [22]; MK(End).
Ischnocoris hemipterus (Schilling) (*flavipes* auct.) [1, 13]; MK(HMl).
Ischnocoris punctulatus Fieber [1, 28]; MK(HMl).
**Eremocoris fenestratus* (Herrich-Schäffer) - Kresna Gorge: N of Kresna, VIII.1987; MK(NM).
Eremocoris pellitus Seidenstücker [16]; MK(PM).
Scolopostethus affinis (Schilling) [1]; ESK(HP).
Scolopostethus decoratus (Hahn) [1]; ESK(WP).
Scolopostethus pictus (Schilling) [1]; ESK(WP).
Scolopostethus pilosus Reuter [1]; ESK(HP).
Scolopostethus puberulus Horváth [1]; ESK(E).
Thaumastopus marginicollis (Lucas) [36]; MK(PM).
Taphropeltus contractus (Herrich-Schäffer) [1]; ESK(WP).
Camptocera glaberrima (Walker) [30]; MK(HM + MA).
Pterotmetus staphyliniformis (Schilling) [1]; ESK(HP).
Aoploscelis bivirgatus (Costa) [1, 28]; MK(HM).
Pionosomus opacellus Horváth (*depressus* Horváth) [1, 25]; ESK(SES).
Ischopeza hirticornis (Herrich-Schäffer) [1]; MK(HM + MA).
Emblethis angustus Montandon [1]; MK(HM).
Emblethis brachynotus Horváth [1]; ESK(SES).
Emblethis denticollis Horváth [1, 12]; MK(HM + MA).
Emblethis griseus (Wolff) [1, 12]; ESK(HA).
Emblethis karamanus Seidenstücker [16]; MK(PM).
Emblethis verbasci (Fabricius) [1, 12]; MK(HMl + MA).
Gonianotus marginepunctatus (Wolff) [1]; ESK(ES).

Trapezonotus (*Trapezonotus*) *arenarius* (Linnaeus) [1, 12]; ESK(HA).
Trapezonotus (*Trapezonotus*) *dispar* Stål [1]; MK(HMl + MA).
Aphanus rolandi (Linnaeus) [1]; MK(HMl + MA).
Proderus crassicornis Jakovlev [30]; MK(PM).
Icus angularis Fieber [1]; MK(HM + MA).
Megalonotus chiragra (Fabricius) [1]; ESK(ES).
Megalonotus praetextatus (Herrich-Schäffer) [1, 12]; MK(HMl + MA).
Megalonotus puncticollis (Lucas) [1, 12]; MK(HM).
Megalonotus sabulicola (Thomson) [1, 12]; ESK(WP).
**Piezoscelis staphylinus* (Rambur) - Belasitsa above Petrich, 400 m, 30.V.1989; MK(HM).
**Lamprodema maurum* (Fabricius) - P. Yavorov Railway Station 25.VII.1985; MK(HMl + MA).
Pezocoris apicimacula (Costa) (*Lasiocoris*) [12]; MK(HM).
Lasiocoris crassicornis (Lucas) [1]; MK(PM).
Peritrechus gracilicornis Puton [1]; MK(NMl + MA).
Peritrechus lundi (Gmelin) [1, 12]; ESK(WP).
Peritrechus nubilus (Fallén) [12]; ESK(WP).
Aellopus atratus (Goeze) [1]; MK(HMl + MA).
**Sphragisticus nebulosus* (Fallén) - Kresnensko Hanche, VIII, on UV-light; ESK(HA).
Graptopeltus consors consors (Horváth) [1, 21]; MK(NM).
Graptopeltus lynceus (Fabricius) [1, 12]; ESK(WP).
Xanthochilus minusculus (Reuter) [1, 12]; MK(HM).
Xanthochilus quadratus (Fabricius) (*immaculatus* Royer) [1, 12]; MK(NMl + MA).
Raglius alboacuminatus (Goeze) (*Rhyparochromus*) [1, 12]; ESK(WP).
Raglius confusus (Reuter) (*Rhyparochromus*) [1, 12]; MK(HMl).
Raglius vulgaris (Schilling) (*Rhyparochromus*) [1, 12]; ESK(WP).
Rhyparochromus phoeniceus (Rossi) [1, 12]; ESK(WP).
Rhyparochromus pini (Linnaeus) [1]; ESK(ES).
Beosus maritimus (Scopoli) [1, 12]; MK(HMl + MA).
Beosus quadripunctatus (Müller) [1, 12, 34]; MK(HM + MA).
**Pachybrachius capitatus* (Horváth) - Rupite near Petrich, 25.VI.1981; new species for the Bulgarian fauna; MK(PM).
Pachybrachius fracticollis (Schilling) [24]; ESK(ES).
Paromius gracilis (Rambur) [1, 9, 12]; MK(HM + MA + Aeth).
Paromius leptopoides (Bärensprung) [1]; MK(HM + MA).

Pyrrhocoridae

Pyrrhocoris apterus (Linnaeus) [1, 12]; ESK(HA).
Pyrrhocoris marginatus (Kolenati) [1, 12, 34]; MK(HMl + MA).

Scantius aegyptius rossii Carapezza, Kerzhner and Rieger (*aegyptius* auct.) [1, 12]; MK(NM + MA).

Stenocephalidae

Dicranocephalus agilis (Scopoli) [1, 12]; ESK(HP).
Dicranocephalus albipes (Fabricius) [1, 12]; MK(HMl).
Dicranocephalus setulosus (Ferrari) [25]; MK(PM).

Coreidae

Gonocerus acuteangulatus (Goeze) [1]; MK(HMl + MA).
Gonocerus juniperi juniperi Herrich-Schäffer [1]; MK(NMl + MA).
Coreus marginatus marginatus (Linnaeus) [1, 12]; ESK(HP).
Syromastes rhombeus (Linnaeus) [1, 12]; ESK(WP).
Haploprocta sulcicornis sulcicornis (Fabricius) [1]; MK(HM).
Centrocoris spiniger (Fabricius) [1, 12]; MK(HM).
Centrocoris variegatus Kolenati [12]; MK(HM).
Phylomorpha laciniata laciniata (Villers) [1, 12]; MK(HM).
Arenocoris waltli (Herrich-Schäffer) [1, 12]; MK(HMl).
Bathysolen nubilus (Fallén) [1, 12]; ESK(WP).
Anoplocerus elevatus (Fieber) (*Ceraleptus brevicornis* Kormilev) [1]; MK(HM).
Ceraleptus gracilicornis (Herrich-Schäffer) [1, 12]; MK(HMl).
Ceraleptus lividus Stein [1, 12]; ESK(E).
Ceraleptus obtusus (Brullé) [1]; MK(HM + MA).
Spathocera dalmani (Schilling) [1, 12]; ESK(WP).
Spathocera lobata (Herrich-Schäffer) [1, 12]; MK(HM + MA).
Coriomeris denticulatus (Scopoli) [1, 12]; MK(HMl + MA).
Coriomeris hirticornis (Fabricius) [1, 12]; MK(HM + MA).
Coriomeris affinis (Herrich-Schäffer) (*spinolai* Costa) [1, 12]; MK(HM).

Alydidae

Alydus calcaratus calcaratus (Linnaeus) [1, 12]; ESK(HA).
Camptopus lateralis (Germar) [1, 12]; MK(HM + MA).

Rhopalidae

Corizus hyoscyami hyoscyami (Linnaeus) [1, 12]; ESK(HP).
Liorhyssus hyalinus (Fabricius) [1, 12]; MK(KSZ & NTr).
Rhopalus (*Rhopalus*) *conspersus* (Fieber) [1]; ESK(WP).
Rhopalus (*Rhopalus*) *distinctus* Signoret [1, 12]; MK(HM).
Rhopalus (*Rhopalus*) *parumpunctatus* Schilling [1, 12]; ESK(HP).
Rhopalus (*Rhopalus*) *subrufus* (Gmelin) [12]; MK(KSZ).
Rhopalus (*Aeschyntelus*) *maculatus maculatus* (Fieber) [1, 12]; ESK(ES).
Rhopalus (*Brachycarenus*) *tigrinus* Schilling [1, 12]; ESK(ES).

Stictopleurus abutilon (Rossi) [1, 12]; ESK(ES).
Stictopleurus pictus (Fieber) [1, 12]; MK(HM).
Stictopleurus punctatonervosus (Goeze) [1, 12]; ESK(SES).
Stictopleurus riveti Royer [1, 12]; MK(HM).
Maccevethus caucasicus (Kolenati) (*persicus* auct.) [1, 12]; MK(NM).
Maccevethus corsicus Signoret (*lineola* auct.) [1, 12]; MK(HM).
Myrmus miriformis miriformis (Fallén) [1]; ESK(ES).
Chorosoma schillingi (Schilling) [1, 12]; MK(HMl + MA).

Cydnidae

Thyreocoris scarabaeoides (Linnaeus) [1, 12]; ESK(WP).
Aethus nigritus (Fabricius) [1]; ESK(HP).
Geotomus caucasicus ciliatitilus Signoret [1, 12]; MK(PM).
Geotomus brunnipennis Wagner [24]; MK(NM).
Geotomus elongatus (Herrich-Schäffer) [1, 16]; MK(HM + MA).
Cydnus aterrimus (Forster) [1]; MK(KSZ).
Legnotus limbosus (Geoffroy) [1, 12]; MK(HMl + MA).
Canthophorus dubius (Scopoli) [1]; ESK(ES).
?*Canthophorus impressus* (Horváth) [1].
Canthophorus melanopterus (Herrich-Schäffer) (*Sehirus*) [1, 12]; MK(HM).
Tritomegas bicolor (Linnaeus) [1]; ESK(HP).
Tritomegas sexmaculatus (Rambur) (*Sehirus*) [1, 12]; MK(NMl).
Sehirus luctuosus Mulsant & Rey [1]; ESK(WP).
Ochetostethus balcanicus Wagner [1, 12]; MK(PM).

Acanthosomatidae

Elasmucha grisea grisea (Linnaeus) [1, 34]; ESK(ES).
Elasmucha grisea antennata (Reuter) [1, 12]; MK(PM).
Cyphostethus tristriatus (Fabricius) [1]; MK(HMl).

Scutelleridae

Odontoscelis (*Odontoscelis*) *fuliginosa* (Linnaeus) [1, 12]; ESK(HP).
Odontoscelis (*Odontoscelis*) *lineola* Rambur (*dorsalis* auct.) [1, 12]; MK(NM).
Psacasta (*Psacasta*) *exanthematica exanthematica* (Scopoli) [1, 12]; MK(HMl + MA).
Psacasta (*Cryptodontus*) *neglecta* (Herrich-Schäffer) [1, 12]; MK(NM).
Odontotarsus freyi Puton (*parvulus* Horváth) [3]; MK(PM).
Odontotarsus plicatulus Horváth (*confraginosus* Hoberlandt) [1, 3, 12, 32]; MK(PM).
Odontotarsus purpureolineatus (Rossi) [1, 3, 12]; MK(HMl).
Odontotarsus robustus Jakovlev [1, 3, 12]; MK(HM).
Odontotarsus rufescens Fieber [8, 12]; MK(PM).

Eurygaster austriaca (Schrank) [1]; MK(HMl).
Eurygaster maura (Linnaeus) [1, 12]; ESK(HP).
Eurygaster testudinaria (Geoffroy) [1, 12]; ESK(HP).
Irochrotus maculiventris (Germar) [1, 16]; MK(HM).

Pentatomidae

Leprosoma inconspicuum Bärensprung [30]; MK(HM).
Ventocoris (*Ventocoris*) *trigonus* (Krynicki) [12]; MK(PM + MA).
Vilpianus galii (Wolff) [1, 12]; MK(HMl + MA).
Ancyrosoma leucogrammes (Gmelin) [1, 12]; MK(HMl + MA).
Tholagmus flavolineatus (Fabricius) [12]; MK(HM).
Graphosoma lineatum (Linnaeus) [1, 12]; ESK(WP).
Graphosoma semipunctatum (Fabricius) [1, 4]; MK(HMl + MA).
Derula flavoguttata Mulsant & Rey [1, 12]; MK(NM).
Mustha spinosula (Lefevre) [1, 12]; MK(PM).
Apodiphus anygdali (Germar) [1, 4, 12]; MK(PM).
Sciocoris (*Aposciocoris*) *macrocephalus* Fieber [1, 12]; MK(HMl).
Sciocoris (*Sciocoris*) *cursitans cursitans* (Fabricius) [1, 12]; ESK(SES).
Sciocoris (*Sciocoris*) *deltocephalus* Fieber [12]; MK(PM + MA).
Sciocoris (*Sciocoris*) *sulcatus* Fieber [1, 12]; MK(HM + MA).
Dyroderes umbriculatus (Fabricius) [1, 12]; MK(HM).
Aelia acuminata (Linnaeus) [1, 12]; ESK(HP).
Aelia rostrata Boheman [1, 12]; ESK(WP).
Aelia virgata Klug [1]; MK(PM).
Neottiglossa leporina (Herrich-Schäffer) [1]; MK(HMl + MA).
Neottiglassa pusilla (Gmelin) [1]; ESK(ES).
Eysarcoris aeneus (Scopoli) [1, 12]; ESK(HP).
Eysarcoris ventralis (Westwood) (*inconspicuum* Herrich-Schäffer) [, 1, 12]; MK(KSZ).
Stagonomus (*Stagonomus*) *amoenus* (Brullé) [1, 12]; MK(HM + MA).
Stagonomus (*Dalleria*) *pusillus* (Herrich-Schäffer) [1, 12]; ESK(WP).
Staria lunata (Hahn) [1, 12]; MK(HMl).
Dryocoris congenitus (Putshkov) (*Holcostethus*) [23]; MK(PM).
Dryocoris strictus strictus (Fabricius) (*Holcostethus*) [1]; MK(HM).
Dryocoris strictus vernalis (Wolff) (*Holcostethus*) [1, 12]; ESK(HP).
Palomena prasina (Linnaeus) [1, 12]; ESK(HP).
Pitedia juniperina (Linnaeus) [1]; ESK(ES).
Carpocoris fuscispinus (Boheman) [12]; ESK(WP).
Carpocoris mediterraneus mediterraneus Tamanini [1, 12]; MK(HM).
Carpocoris pudicus (Poda) [1, 12]; MK(HMl).
Carpocoris purpureipennis (De Geer) [1]; ESK(ES).
Codophila varia (Fabricius) [1, 12]; MK(HM + MA).
Antheminia lunulata (Goeze) [1, 12]; ESK(WP).

Dolycoris baccarum (Linnaeus) [1, 12]; ESK(HP).
Holcogaster exilis Horváth [1, 17]; MK(HM).
Trochiscocoris rotundatus Horváth [1, 12]; MK(PM).
Bagrada confusa Horváth [1]; MK(PM).
Eurydema (*Eurydema*) *oleraceum* (Linnaeus) [1, 12]; ESK(HP).
Eurydema (*Eurydema*) *ornatum* (Linnaeus) [1, 12]; ESK(HP + Or).
Eurydema (*Eurydema*) *rugulosum* (Dohrn) [30]; MK(PM).
Eurydema (*Eurydema*) *ventrale* Kolenati [12]; MK(HMl + MA).
Nezara viridula (Linnaeus) [1, 12, 33]; MK(KSZ).
Acrosternum heegeri Fieber (*millieri* auct.) [1, 21]; MK(HM + Aeth).
Piezodorus lituratus (Fabricius) [1, 12]; ESK(WP).
Rhaphigaster nebulasa (Poda) [1, 12]; MK(HMl + MA).
Picromerus conformis (Herrich-Schäffer) [1]; MK(PMl).
Arma custos (Fabricius) [12]; ESK(SES).
Arma insperata Horváth [1]; MK(PM).
Jalla dumosa (Linnaeus) [1]; ESK(HP).
Zicrona caerulea (Linnaeus) [1, 12]; ESK(HA = Or).

Plataspidae
Coptosoma scutellatum (Geoffroy) [1, 12]; ESK(SES).

3. Discussion and zoogeographical evaluation of the faunistic data

The number of heteropterans reported from the investigated region so far is 612, which is more than 60% of all species, met on the territory of Bulgaria. Forty species (marked by an asterisk) were reported for the first time from the investigated region. The taxonomic status of the species *Macrotylus interpositus* is reduced to a subspecies of *M. paykulli*. Understandably no representatives of the high mountainous fauna, characteristic for the mountains surrounding the kettle, can be expected in the Sandanski-Petrich Kettle. But as we shall see further, separate populations of species from this fauna have managed to adapt themselves to the lowland conditions and to differentiate themselves as distinct subspecies - a result of a Mediterranean form-formation on the basis of an Euro-Siberian initial material. This process has been observed all around the Mediterranean where there are valleys, which lie in close vicinity to high mountains.

According to GÖLLNER-SCHEIDING & ARNOLD (1988), 45% of the species, met in the investigated region, are Mediterranean. But our evaluation, formed on the basis of greater number of faunistic data, shows that the species of the Mediterranean faunistic complex prevail over those of the Euro-Siberian complex.

3.1. Mediterranean complex

The Mediterranean complex includes species with Holo-Mediterranean, North Mediterranean, Atlanto-Mediterranean, Ponto-Mediterranean and West Mediterranean distribution. Some of these species (probably those, which are phylogenetically younger and ecologically more flexible) have managed to expand their range to the north and also to the west as in the case of Ponto-Mediterranean species. They are designated in Section 2 as HM1 and PM1. Most probably some of the species with West Palaearctic distribution also belong to the Mediterranean complex (see below).

The classification of the separate species as belonging to the Mediterranean complex has been made not only on the basis of their distribution, but by taking into consideration some other of their peculiarities as well: trophic connections, phenology, density of populations in various parts of the range, etc. A basic indicator, of course, is their distribution, but this can be quite misleading, if the other peculiarities are not known, especially when the data of their distribution are incomplete. Thus for example, on the basis of the initial data for the distribution of *Rhabdomiris striatellus*, this species was considered as „European" and later as „Westpalaearctic". But afterwards it was found that it belongs to the Mediterranean faunistic complex. The same is true for the species *Dryophilocoris flavoquadrimaculatus*, *Cyllecoris histrionius* and *Phylus melanocephalus*. In all the four cases we have stenophages, trophically connected only with genus *Quercus*, which is a characteristic genus for the Mediterranean. In the Sandanski-Petrich Kettle these species appear early in the spring (which is very typical for the Mediterranean Miridae species). They have a great population density and are predominant for the heteropterous fauna of the oak.

The connection between the trophic specialisation and the distribution of the heteropterans was discussed for the first time by Josifov (1984, Verh. SIEEC X.: 99-101). Phylogenetically the greater antiquity of the species from the Mediterranean complex determine the stenophagy of the majority of them, broadly speaking. Such species are trophically connected mainly with Mediterranean plant species and genera. On the contrary, the Euro-Siberian species are in most cases euryphages, and as far as there are stenophages among them, they are connected with Euro-Siberian plant species. Thus for example in the Sandanski-Petrich Kettle a number of typical Mediterranean stenophages such as *Phytocoris meridionalis*, *Reuteria marqueti*, *Closterotomus princeps*, *Rhabdomiris striatellus*, *Orthotylus quercicola*, *Globiceps sphefiformis*, *Cyllercoris histrionius*, *Dryophilocoris flavoquadrimaculatus*, *Harpocera thoracica*, *Harpocera hellenica*, *Psallus asthenicus*, *Psallus milenae*, *Psallus cruentatus*, *Psallus mollis*, *Astenarius nigripilis*, *Phylus melanocephalus*, *Icodema infuscatum*, *Picromerus conformis* and *Arma insperata*, are trophically connected (the predator species indirectly of course) with genus *Quercus*, which is characteristic for the Mediterranean.

Yet the northern boundary of the range of genus *Quercus* in Europe lies considerably far in the north. This circumstance was the reason for a number of species from the Euro-Siberian complex such as *Deraeocoris lutescens*, *D. olivaceus*, *D. trifasciatus*, *Pilophorus perplexus*, *Coreus marginatus*, *Palomena prasina*, *Rhaphigaster nebulosa*, etc., to be also trophically connected with the oak. These are species with a comparatively wide nutrition spectrum. They are not stenophages.

The narrow correlation between the biogeographical character of the food plant and the heteropterous fauna, which is trophically connected with it, is seen much more clearly in the woodlike juniper (*Juniperus excelsa*), which is a strictly Mediterranean species. All the heteropters, trophically connected with it (*Dichrooscytus bureschi*, *Orthotylus bureschi*, *O. junipericola balcanicus*, *Phytocoris parvulus*, *Gonocerus juniperi*, *Orsillus depressus* and *Holcogaster exilis*) are exclusively Mediterranean.

The correlation between the phenology of the Mediterranean Miridae species and their zoogeographic characteristics was discussed by JOSIFOV (Proc. of the 4th ECE/XIII.SIEEC: 634-636). Many of the Mediterranean species mentioned above, which are trophically connected with the oak, are found only from the middle of April till the middle of June and are absent during the summer months. Also characteristic in this respect is the herbobiontic species *Cremnorrhinus basalis*, which in Bulgaria is met only in the Sandanski-Petrich Kettle. It is a strict monophage, which feeds only on *Geranium rotundifolium*, and not even on the rest of the *Geranium* species, which form thick overgrowths in the shadows of the trees in the spring. The imago of *C. basalis* appears in the beginning of May and disappears completely at the end of the same month or in the beginning of June at the latest together with the disappearance of its ephemeral food plant.

This peculiarity of the phenology - the appearance of the imago in spring and its disappearance in the summer months, which is characteristic for many species of Miridae - has an explanation: these were species, arising and forming their phenology under the conditions of the Mediterranean climate. This climate is characterised by a mild and humid winter, warm and humid spring, and dry and hot summer. In winter these species successfully end their embryogenesis and in the beginning of spring they also quickly finish their larval development. The imago lays its eggs about the end of spring and they spend the dry and hot summer and autumn months in diapause.

In the Sandanski-Petrich Kettle there are also Mediterranean species, which are not met in spring, but appear only during the hot and dry summer months. On the oak such species are *Reuteria marqueti* and *Phytocoris meridionalis*, and probably the exceptionally rare *Acrorrhinium conspersus*. This last species was caught here only by the light of an UV-lamp. There is one more species, the biology and trophic connections of which are not known, that also appears only during the warm August nights by the light of an UV-lamp. This is *Dicyphus marti-*

noi. The herbobiontic species *Systellonotus discoidalis* also comes about in August. The appearance of these species during the hottest and driest months of the year is presumably due to their having emerged and formed their phenology under the conditions of the Asiatic climate, which is characteristic for the areas to the east of the Mediterranean. Some of them are met there even today. This climate is distinguished by a dry and cold winter, which retards the development of their embryogenesis. Because of this generally drier climate their whole development lasts longer. Once they had formed their phenology, adjusting it to the peculiarities of the climate, these ancient and conservative species have also managed to preserve it after penetrating into the eastern parts of the Mediterranean. The recent distribution of the species is also indicative of their close links with the Asiatic continent.

Although the Struma Valley is not widely open southwards to Aegean Thrace, it is an important way for the penetration of Mediterranean species to the north. With the global warming up of the climate during the recent years this takes place, so to say, before our eyes. Indicative in this respect are the cases of incidental occurrence of specimens of some Mediterranean species. Thus, for example, more than 50 years ago there was found *Odontotarsus freyi* in the Kresna Gorge, and recently there were also found *Caenocoris nerii* (a single specimen in a colony of *Tropidothorax leucopterus*, probably come here because of a similarity in the pheromone communication between the individuals of the two species), *Lygaeosoma angulare*, *Camptocera glaberrima*, *Proderus crassicornis*, *Piezoscellis staphylinus*, *Nabis palifer*, *Sastrapada baerensprungi*, etc.

3.1.1. Ponto-Mediterranean species

The Ponto-Mediterranean (or East-Mediterranean) species comprise more than 28% of all the Mediterranean species, met in the investigated region. Their occurrence in the eastern parts of the Mediterranean is due to the long geographic isolation of Aegeida from Thyrrenida during Tertiary. Thus in the eastern part of the Mediterranean not only many Ponto-Mediterranean species were formed, but some genera as well. Such genera in the Sandanski-Petrich Kettle are *Nanopsallus*, *Paredrocoris*, *Acrorrhinium*, *Apodyphus* and *Mustha*, as well as the subgenera *Dicyphus* subgen. *Mesodicyphus* and *Temnostethus* subgen. *Montandoniella*. The endemic genera *Cremnorrhinus* and *Adelphiphylus* should also be added to them.

Many of the Ponto-Mediterranean species show an obvious tendency to expand their range to the west. A characteristic example for the Ponto-Mediterranean fauna of the Sandanski-Petrich Kettle is *Eurydema rugulosum*, which is a common species for the region of the Strandja Mountain and sporadically for the foot of the Rhodopi Mountains as well. It was found in the Sandanski-Petrich Kettle as early as 1991. This is its most western locality on the territory of the Balkan Peninsula so far. Having in mind that the kettle has been

the object of intense investigation work for more than half a century, it is hard to presume that such a typical species had remained unnoticed before.

3.1.2. West-Mediterranean species

After the rising up of the Apenine Peninsula at the end of Tertiary a certain number of West-Mediterranean species went further eastwards and reached the Balkan Peninsula. The majority of them were unable to overcome the mountain ranges along its west coastline and can be met now only along the Adriatic coast. Some of them go as far south as the island of Crete. However there is a small number that have somehow managed to go more far into the west part of the peninsula. Two such species (*Phytocoris femoratus* and *Tinicephalus discrepans*) can also be met in the Sandanski-Petrich Kettle, but not much further to the east of it.

3.1.3. Cosmopolitans of the tropical and subtropical zones (tropopolites)

A small number of species, designated by some authors as cosmopolitans of the tropical zones and by others as tropopolites, might be viewed as an independent faunistic complex, but since they are spread only in the Mediterranean subarea of the Palaearctics, we consider them as belonging to the Mediterranean faunistic complex. These are *Ochterus marginatus*, *Anisops sardea*, *Mesovelia vittigera*, *Trigonotylus tenuis*, *Taylorilygus pallidulus*, *Sastrapada baerensprungi*, *Lygaeus pandurus*, *Geocoris pallidipennis*, *Lyorhyssus hyalinus*, *Rhopalus subrufus*, *Cydnus aterrimus*, *Eysarcoris ventralis* and *Nezara viridula*. However only *Ochterus marginatus* should be viewed as a relict of the ancient tropical fauna, inhabiting the southern parts of the European continent during Tertiary. The remaining species are eurybionts, that have probably penetrated secondarily in the southern parts of the Palaearctics through an attempt to expand their ranges to the north.

3.1.4. Montane-Mediterranean species

Already before the glaciations in the second half of the Pleistocene the high mountains surrounding the Sandanski-Petrich Kettle had a colder climate. Adjusted to this climate was a Mediterranean fauna, distinguished in species composition from that in the lowlands. The glaciations in the second half of the Pleistocene had been the cause for the almost complete destruction of that fauna, and particularly the species inhabiting the high mountainous steppes which had been incapable to overcome the barrier of the coniferous belt and go down into the lowlands, where they could have survived. Today only a small number of representatives of the Montane-Mediterranean fauna are preserved. One of them - *Orthops* (*Montanorthops*) *foreli*, which is trophically connected with the genus *Rumex* - probably already in the Pleistocene might have had a wider vertical distribution in the mountains of the Balkan Peninsula and Asia Minor. Even today this species would descend down the slopes of the mountains as far as the Sandanski-Petrich Kettle.

3.1.5. Mediterranean form formation on the basis of Eurosiberian initial material

A small number of species, resulting from a Mediterranean form-formation on the basis of an Eurosiberan initial material, should also be incorporated into the Mediterranean complex. In the Mediterranean, where in many places high mountains are found in close proximity to lowlands with Mediterranean and Submediterranean climate, certain populations have managed to penetrate into the lowlands and adapt themselves to the local conditions. Thus they have settled themselves into lowlands with a Mediterranean and Submediterranean climate, and certain populations have managed to penetrate into the lowlands and adapt themselves to the local conditions. Thus they have set themselves apart as distinct subspecies. Such species in the Sandanski-Petrich Kettle are *Monalocoris filicis atlanticus*, *Placochilus seladonicus mediterraneus*, *Psallus varians cornutus*, *Lopus decolor palliatus*, as well as the yet undescribed *Orthotylus tenellus* subsp. n., and probably the Euro-Siberian populations of some other Euro-Siberian species. The nominal subspecies of these species are met even today in the surrounding high mountains above a definite altitude. There is always a certain vertical isolation between them and the corresponding lowland subspecies.

3.1.6. West-Palaearctic species (partim)

As has already been mentioned, some (but by no means all) West-Palaearctic species evidently also belong to the Mediterranean complex. Here should also be added part of the species trophically connected with genus *Pinus*, such as *Camptozygum aequalis*, *Dichrooscytus rufipennis*, *Plesiodema pinetellum*, *Phoenicocoris obscurellus*, *Atractotomus magnicorne*, *Atractotomus marcoi*, *Orthotylus* (*Pinocapsus*) *fuscescens*, etc. The pine forests had had a wide distribution throughout the whole of South Europe already before the glacial times. The restricted distribution of these species in Europe or in the western part of the Palaearctics and the peculiarities of their vertical distribution speaks of their narrow links with the Mediterranean.

4. Euro-Siberian complex

According to our categorisation this complex comprises the species with Euro-Siberian, Palaearctic -i. e. West-Palaearctic (partim) - and Holopalaearctic, as well as Holarctic distribution. As it is evident from Section 2, these species are less in number in the Sandanski-Petrich Kettle than those belonging to the Mediterranean complex.

4.1. Species with Palaearctic distribution

In our opinion the species with Palaearctic distribution are nothing less than

Euro-Siberian species s. l. Probably they are younger Euro-Siberian species and because of that eurybionts, having a wide horisontal as well as vertical distribution. That is why they can also be met in the lowlands of the South Palaearctic subregions, which in our case are the lowlands of the Mediterranean subregion. *Dolycoris baccarum* and *Lygus rugulipennis* are typical examples. They are just as common in both the humid and dry or sunny biotopes of the Sandanski-Petrich Kettle as in all the height belts of the surrounding high mountains.

4.2. Euro-Siberian species (s. str.)

Unlike the species with Palaearctic distribution, the majority of Euro-Siberian species s. str. in the regions situated at the same latitude as the Sandanski-Petrich Kettle are met only in the mountains with a definite altitude and are missing in the kettle itself. Nevertheless some species do penetrate into it along the Struma valley because the microclimate in the riverside biotopes is colder. The presence of some of them is conditioned by their trophic connections with certain trees, as those from the genera *Salix*, *Populus*, *Alnus*, etc., or by the colder microclimate of the riverside biotopes and their euryphagy. A number of Euro-Siberian species have their most southernmost distribution on the Balkan Peninsula here. Such are *Myrmecoris gracilis*, *Monosynamma bohemani*, *Lygocoris* (*Neolygus*) *zebei*, *Blepharidopterus diaphansus*, *Sphragisticus nebulosus*, *Dimorphopterus spinolai*, etc. *Nabis rugosus*, a very typical Euro-Siberian species, which is met in the surrounding mountains only above 1000 meters, inhabits the wet underpass of the riverside woods, but only in places where the shade is thick enough.

5. Endemics

Seventeen of the species and subspecies, which are found in the Sandanski-Petrich Kettle, are endemic for the Balkan Peninsula. These are *Velia serbica*, *Dicyphus martinoi*, *Phytocoris strimonensis*, *Closterotomus princeps*, *Dichrooscytus bureschi*, *Orthotylus bureschi*, *Orthitylus junipericola balcanicus*, *Orthotylus tenellus* subsp. n., *Pilophorus dianae*, *Cremnorrhinus basalis*, *Eurycolpus bipunctatus*, *Adelphophylus balcanicus*, *Paredrocoris seidenstueckeri*, *Tuponia linnavuorii*, *Isometopus longirostris*, *Gampsocoris lilianae* and *Ischnocoris bureschi*. Only four of the above-listed species (*Phytocoris strimonensis*, *Dichrooscytus bureschi*, *Isometopus longirostris*, and *Gampsocoris lilianae*) have been known from the Sandanski-Petrich Kettle so far.

It is hard to say that the Sandanski-Petrich Kettle is distinguished by a high endemism according to its heteropterous fauna. The above-mentioned endemics comprise less than 3% of the species composition of the heteropterans met here. But in comparison with the adjoining territories of the Balkan Peninsula, situat-

ed at the same latitude, the endemism of the heteropterous fauna of the kettle is comparatively higher.

The criteria as to which species should be considered as Balkan endemics are purely chorological and hence too formal. This holds true especially for the recently described species, the distribution of which has been insufficiently studied. But there also are some species, described during the last century and long considered as Balkan endemics, that have recently been found in some neighbouring regions. Some of the species, described lately from the Sandanski-Petrich Kettle, have also been found outside the Balkan Peninsula. Such examples are *Heterocordylus citysi*, which was described for the first time from the surroundings of Petrich and was also found in the Crimean Peninsula, and *Psallus milenae*, described from the Kresna Gorge and also found in Asia Minor.

The category of Balkan endemics is very characteristic in zoogeographical respect, since it comprises both the species which belong to the Euro-Siberian and those belonging to the Mediterranean faunistic complex. The majority of the Balkan endemics belong to the Mediterranean faunistic complex. Only *Velia serbica* belongs to the Euro-Siberian faunistic complex in the Sandanski-Petrich Kettle.

According to their origin, the Balkan endemics belong to one of the groups mentioned below.

5.1. Endemics resulting from postglacial form formation on the basis of Euro-Siberian initial material

These are Euro-Siberian forms, situated to the north of the peninsula, the populations of which came to be isolated from their basic ranges after the glaciation. Owing to the short period of time after the glaciation (about 11 000 years) the greater part of the above mentioned populations have not undergone essential changes. Nevertheless some of them differentiated themselves into taxonomically authentic and distinct forms. In order to emphasize their genetic link with the initial forms it is best to consider them as subspecies. Unfortunately there is no agreement on this point. In any case they are mountainous inhabitants and when we say that the observed form-formation is Euro-Siberian, it is because the conditions in the high mountains of the peninsula are very similar to those of the Euro-Siberian subregion, which means that the high parts of the Balkan mountains practically belong to the Euro-Siberian subregion. It is only natural that such endemics are found exclusively in the mountainous regions and that they are missing in the Sandanski-Petrich Kettle, with the exception of *Velia serbica*. This semi-aquatic species is, so to say, a temporary guest of the kettle. Hibernating specimens would descend in the kettle in the spring, when the temperature of the water of the springs running down the surrounding high mountains is moderately low. As far as its taxonomic position is concerned, it should be noted that *Velia serbica* was first described as a subspecies of the *Velia saulii*, which is found in Middle Europe and which, in our opinion, is true.

5.2. Endemics resulting from Mediterranean form formation on the basis of Euro-Siberian initial material

It has already been mentioned (in section 3.1.5) that in the Mediterranean, where high mountains are found in some places in close proximity to lowlands with Mediterranean and Submediterranean climate, certain populations of mountainous Euro-Siberian species have penetrated into the lowlands, adapting themselves to the local conditions. Two such subspecies - *Psallus varians cornutus* and *Placochilus seladonicus mediterraneus* - were first described from the Balkan Peninsula and considered as Balkan endemics, but were later also found outside the peninsula. For the time being only the undescribed *Orthotylus tenellus* subsp. n. should be considered as a Balkan endemic, since it is known exclusively from South Pirin and the Island of Crete, where it is trophically connected with *Quercus coccifera* and *Q. pubescens.*

5.3. Endemics which are relicts from the preglacial Mediterranean fauna

With the exception of the three endemic subspecies mentioned above, all the remaining Balkan endemics, represented in the heteropterous fauna of the Sandanski-Petrich Kettle, should be considered as belonging to this group. In a wide sense of the word, all the Mediterranean species (s. str.) are relics from the preglacial Mediterranean fauna. These are such species, the ranges of which do not exceed or exceed only slightly the boundaries of the Mediterranean subregion. Yet only those, whose ranges are confined within the limits of the Balkan Peninsula or some part of it are designated as Balkan endemics. The range of some of the Balkan endemics is very limited. Thus for example, *Gampsocoris lilianae* has been found so far only at the foot of the Belasitsa Mountain above Petrich and in the surroundings of Melnik; whereas *Phytocoris strimonensis, Dichrooscytus bureschi* and *Isometopus longirostris* only in the Kresna Gorge.

A peculiarity of most endemics is their narrow food specialisation. It has already been mentioned (in section 3.1) that the Balkan endemic *Cremnorrhinus basalis* is a strict monophage, which feeds only on *Geranium rotundifolium* and on no other species of the genus *Geranium.* The same holds true for *Dichrooscytus bureschi,* which feeds only on *Juniperus excelsa* and not on *Juniperus oxycedrus,* growing in the same area. Little is known about the trophical connections of the remaining Balkan endemics. Most probably their limited range has been the result of their stenobiontness and mainly their narrow food specialization.

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Полутвърдокрилите насекоми (Insecta: Heteroptera) в Сандански-Петричката котловина

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(Резюме)

Изследването обхваща Сандански-Петричката котловина и местата на север от нея, Кресненското дефиле и склоновете на заобикалящите долината високи планини до около 400 m надм. в., т. е. една територия от около 600 квадратни километра, която лежи изцяло в пояса на ксеротермните дъбови гори.

От изследвания район са съобщени досега 613 вида хетероптери, което е повече от 60% от всички видове, срещащи се на територията на България. Отбелязаните със звездичка 40 вида се съобщават за първи път от изследвания район, а *Caenocoris nerii* и *Pachybrachius capitatus* са нови за фауната на България. Променен е таксономичният статус на *Macrotylus interpositus* от самостоятелен вид в подвид на *M. paykulli*.

Съгласно концепцията на автора за произхода и зоогеографския характер на южноевропейската насекомна фауна, видовете, намерени в котловината могат да бъдат групирани в две групи, съобразно тяхната принадлежност към двата основни фаунистични комплекса - медитеранския и евросибирския. Видовете от медитеранския фаунистичен комплекс преобладават над тези от евросибирския.

Към медитеранския комплекс се причисляват видове с холомедитеранско, северомедитеранско, атлантомедитеранско, понтомедитеранско и западномедитеранско разпространение. Някои от тези видове, вероятно филогенетично по-младите, които са и екологично по-пластични, са успели да разширят своя ареал на север, а що се отнася до понтомедитеранските и на запад. Към медитеранския комплекс принадлежат най-вероятно и някои от видовете със западнопалеарктично разпространение. Понтомедитеранските (източномедитеранските) видове съставляват повече от 28% от всички медитерански видове, които се срещат в изследвания район. Тяхното присъствие в източните части на Средиземноморието се дължи на продължителната географска изолация на Егеида от Тиренида през Терциера. Така в източната част на Средиземноморието са се формирали не само много понтомедитерански видове, но даже и родове. След издигането на Апенинския полуостров към края на терциера известен брой западномедитерански видове са се разпространили на изток и са достигнали Балканския полуостров. Повечето от тях не са успели да преодолеят планинските вериги край западното му крайбрежие, но малък брой видове са успели все пак да проникнат по-дълбоко в западната част на полуострова. Една малка група видове, означавана от някои автори като космополити на тропичните зони, а от други - като тропополити, биха могли да се разглеждат като самостоятелен фаунистичен комплекс, но тъй като в рамките на Палеарктика са разпространени само в медитеранската подобласт, са причислени към медитеранския фаунистичен комплекс. Само малък брой представители на монтанмедитеранската хетроптерна фауна са се запазили до днес. Към медитеранския комплекс би трябвало да бъдат причислени и една малка група от видове, плод на медитеранско формообразуване за сметка на евросибирски изходен материал. В Средиземноморието, където на много места високи планини се намират в

непосредствена близост до низини с медитерански или субмедитерански климат, отделни популации на характерни планински евросибирски видове са успели да проникнат в низините и да се приспособят към местните условия. Така в постглациално време те са се обособили в самостоятелни подвидове. Към медитеранския комплекс очевидно принадлежат и някои западнопалеарктични видове.

Към евросибирския комплекс са причислени видовете с евросибирско, палеарктично т. е. западнопалеарктично (partim) и холопалеарктично, както и холарктично разпространение. Видовете с палеарктично разпространение не са нищо друго освен евросибирски видове s. l. - вероятно по-млади евросибирски видове, които поради това са еврибионти и имат широко както хоризонтално, така и вертикално разпространение. Както във влажните, така и в сухите и припечни биотопи в Сандански-Петричката котловина те са точно толкова обикновени, колкото и във всички височинни пояси на околните високи планини. За разлика от видовете с палеарктично разпространение, в районите с географската ширина на Сандански-Петричката котловина повечето от евросибирските видове s. str. се срещат само в планините над определена надморска височина, но липсват в котловината. Отделни видове обаче проникват и в нея по поречието на Струма, тъй като микроклиматът в крайречните биотопи е по-хладен. Присъствието на някои от тях се обуславя от трофичните им връзки с определени дървесни видове или от по-хладния микроклимат на крайречните биотопи и тяхната еврифагия. Редица евросибирски видове имат тук своето най-южно разпространение на Балканския полуостров.

Седемнадесет от срещащите се в Сандански-Петричката котловина видове и подвидове хетероптери са ендемити за Балканския полуостров. Четири от тях са известни досега само от Сандански-Петричката котловина. Ендемитите съставляват по-малко от 3% от видовия състав на хетероптерите, които се срещащи се в котловината. В зоогеографско отношение категорията балкански ендемити е твърде хетерогенна, тъй като в нея се включват както видове, които принадлежат към евросибирския, така и такива, които принадлежат към медитеранския фаунистичен комплекс. По-голямата част от балканските ендемити принадлежат към медитеранския фаунистичен комплекс. Характерна особеност на повечето ендемити е тяхната тясна хранителна специализация.